

licensed Master falconers at approximately 10 d of age in return for information on their growth and development. Young produced using frozen semen have developed normally.

The level of fertility obtained in this study was low but encouraging. Others have obtained fertility levels of up to 30% with frozen kestrel semen using dimethylacetamide as the cryoprotectant rather than glycerol (Brock et al. 1983; Brock 1986). George Gee (pers. comm.) suggested that 50% fertility can be obtained with frozen kestrel semen when dimethyl sulfoxide was used as the cryoprotectant. We have been unable to maintain post-thaw viability of Peregrine sperm with either of these cryoprotectants. The procedures used in this study demonstrate that use of frozen semen is a realistic option in the captive breeding of large falcons. However, more practical methods for processing peregrine semen and higher fertility are needed before frozen semen will be useful in most captive breeding situations.

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### NORTHERN HARRIER (*Circus cyaneus*) PREDATION ON WINTERING WATERFOWL

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Foods of the Northern Harrier (*Circus cyaneus*) include mammals (small and/or immature individuals), birds (mostly passerines), amphibians, reptiles, insects and carrion (Errington and Breckenridge 1936; Randall 1940; Hecht 1951; Weller et al. 1955). Blohm et al. (1980) reported flushing harriers from waterfowl carcasses; however, it is uncertain if these harriers had actually killed or were scavenging.

Schipper et al. (1975) observed Northern Harriers opportunistically preying on sick or wounded waterfowl, and Fitzpatrick (1979) observed a harrier drowning a Common

Moorhen (*Gallinula chloropus*). However, few observations of harrier attacks on healthy adult or subadult waterfowl have been documented. Hammond (1948) and Griffiths et al. (1954) described harrier attacks on waterfowl; accounts were based upon single observations. Additionally, in neither account was the physical condition of the prey reported.

Our objective is to report four chronological observations of Northern Harriers attacking wintering waterfowl in Castro, Hale, and Parmer counties, Texas. In three of the four observations the ducks were known to be capable of

flight, and all of the carcasses recovered had deposits of visceral, omental, and subcutaneous fat. The harrier in each observation was dark brown with chest and wing streaking, presumed to be a female.

On 22 January 1985, about 1630 H, a male Northern Pintail (*Anas acuta*) was apparently wounded by hunters. The pintail flew a short distance, landed on ice near an area where a harrier had previously been observed quartering for prey, and walked toward shoreline vegetation. The harrier reappeared and quickly approached the pintail. The pintail crouched evading the harrier's initial attack. The harrier then circled and grasped the pintail. No movement was seen from the pintail afterwards, and it was apparently dead before the harrier started feeding. Attacks by the harrier came both with and against the wind, a behavior not previously described for attacks on waterfowl. The carcass of the pintail could not be recovered for examination.

On 14 December 1985, about 1100 H, several Green-winged Teal (*A. crecca*) were flushed from an opening in lake ice. The majority of the teal remained together; however, a male separated and landed on the ice. A harrier previously seen quartering for prey grasped the lone teal, but was unable to retain its grip on the back of the duck. Following the initial attack, the teal made four attempts to escape by flight, only to be driven back onto the ice by the harrier. The harrier successfully captured the teal on the fifth attempt pinning it onto the ice. Several seconds passed without any movement from the teal before the harrier began feeding. Examination of the carcass revealed fat reserves, indicating the teal was not emaciated from stress or disease.

On 19 December 1985, about 1130 H, a harrier attacked a flock of American Wigeon (*A. americana*) on open water surrounded by ice. Following the attack, most wigeon flew several meters and landed on the ice, but one male submerged. When the male wigeon resurfaced, the harrier dropped from a hovering position and the duck submerged again. The harrier hovered with legs descended, apparently aided by a strong wind. The harrier attacked seven times before the wigeon attempted to escape by flight. The harrier quickly grasped the wigeon in the scapular region, and both birds fell to the ice. The wigeon struggled and nearly escaped, but the harrier successfully held the duck onto the ice. The wigeon continued to struggle but died following repeated strikes to the head and neck by the harrier. The harrier fed only upon the breast region of the wigeon. Examination of the carcass revealed fat reserves, indicating the wigeon was not emaciated from stress or disease. No previous record of aerial attacks on subadult or adult waterfowl by harriers was located.

On 18 February 1986, about 1630 H, a harrier was seen with both feet clasped around the neck of a male Green-winged Teal and was attempting to drag the duck from the water. The harrier released its grip and the teal

submerged. The harrier hovered with legs descended until the teal resurfaced and then attacked again, a sequence which occurred several times. The harrier once again caught the teal by the neck, but the teal struggled and escaped. At this point, the harrier flew off but returned, passing over several ducks including the previously attacked teal. The teal initiated a series of dives which the other ducks did not. The harrier hovered, made several unsuccessful attacks each time the teal resurfaced, and then flew away. The teal rejoined a group of ducks nearby.

Our observations contribute information on the hunting behavior of Northern Harriers. Additionally, we also observed Northern Harriers perched on waterfowl traps containing ducks. From our observations it is apparent that wintering harriers will opportunistically prey on live waterfowl.

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